Guide compiled by Tr Alex

THE SIPRO PRE-PLE SET VI 2024

MATHEMATICS

Time Allowed: *2 Hours 30 Minutes*

Index No.	Random No.						Personal No.		

Candidate's Name: _____

Candidate's Signature: _____

School Random No: _____

District ID: _____

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. This paper has two sections: A and B.
2. Section A has 20 questions (40 Marks).
3. Section B has 12 questions (60 Marks).
4. Attempt all questions in both sections. All answers to both sections A and B must be written in the spaces provided.
5. All answers must be written in blue or black ball point pens or ***ink***. Only diagrams and graph work must be done in ***pencil***.
6. Unnecessary ***alteration/crossing*** of work will lead to loss of marks.
7. Any ***handwriting*** that cannot be easily read may lead to loss of marks.
8. Do not fill anything in the boxes indicated:

"FOR EXAMINER'S USE ONLY"

For Examiner's Use Only;

Qn No.	MARKS	INITIALS
1 - 5		
6 - 10		
11 - 15		
16 - 20		
21 - 22		
23 - 24		
25 - 26		
27 - 28		
29 - 30		
31 - 32		
Total		

Please turn over

THE SIPRO EDUCATIONAL SERVICES LIMITED - KAMPALA

PUBLISHERS OF THE SIPRO TEACHERS' GUIDES, LEARNER'S WORKBOOKS & PUPIL'S COMPANIONS

SECTION A: 40 MARKS

Attempt **all** *questions in this section.*
Questions **1** *to* **20** *carry* **two** *marks each*

1. **Work out:** 3 0 2
   x 3

   906
   ---

2. Given that **W** = { 1,2,3 }, find the number of proper subsets in set **W**

$n(C) = 2^n - 1$

$n(C) = 2^3 - 1$

$2 \times 2 \times 2 - 1$

$8 - 1$

$n(C) = 7$

3. Find the **range** of -3, 6, 0, -7

$R = H - L$

$6 - (-7)$

$6 + 7$

13

4. **Work out;** $312_{four} + 33_{four}$

$\overset{1}{3}\overset{1}{1}2_{four}$

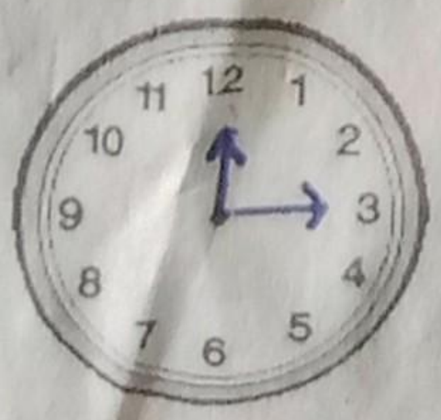
$+ 33_{four}$

1011_{four}

$5 \div 4 = 1r1$

$4 \div 4 = 1r0$

5. On the clock face below, represent 0015 hours.



0015 hours → 12:15am

6. $2e^\circ$ and $(3e-10)^\circ$ are complementary angles. Find the value of **e**.

$2e^\circ + (3e-10)^\circ = 90^\circ$

$2e + 3e - 10 = 90$

$5e - 10 = 90$

$5e - 10 + 10 = 90 + 10$

$\frac{5e}{5} = \frac{100}{5}$

$e = 20$

7. **Solve:** $3 - 3h \geq 15$

$3 - 3h \geq 15$

$3 - 3 - 3h \geq 15 - 3$

$-3h \geq 12$

$\frac{-3h}{-3} \leq \frac{12}{-3}$

$h \leq -4$

8. The prime factors of P and Q are $F_p = \{n, 3_1, 3_2\}$ and $F_Q = \{3_1, 5_1, n\}$. If the G.C.F is 6, find the value of **n**.

Product of $P \cap Q = GCF$

$n \times 3 = 6$

$\frac{3n}{3_1} = \frac{6^2}{3_1}$

$n = 2$

9. **Work out;** $(5 \times \frac{1}{12}) - (2 \times \frac{1}{12})$

$\frac{1}{12}(5-2)$

$\frac{1}{12} \times 3^1 = \frac{1}{4}$

OR $\frac{5}{12} - \frac{2}{12} = \frac{3^1}{12_4}$

$\frac{1}{4}$

10. A hawker bought a belt at sh. 25,000. At what price should he sell i he intends to make a profit of sh.3,000?

$S.P = B.P + P$

Sh. 25,000

+Sh. 3,000

Sh 28,000

11. **Work out;** 2 – 5 = _____(finite 6)

2 - 5 = — (finite 6)

2 + 6 - 5 = — (finite 6)

8 - 5 = 3 (finite 6)

2 - 5 = 3 (finite 6).

12. Obote had a tyre of radius 35cm. How many revolutions will it make to cover a distance of 11 hectometres?

$C = 2\pi r$

$C = 2 \times \frac{22}{7_1} \times \frac{5}{35}cm$

$C = 220cm$

Km	Hm	Dm	m	dm	cm	mm
	1	0	0	0	0	

1Hm → 10,000cm

11Hm → 11 x 10000cm

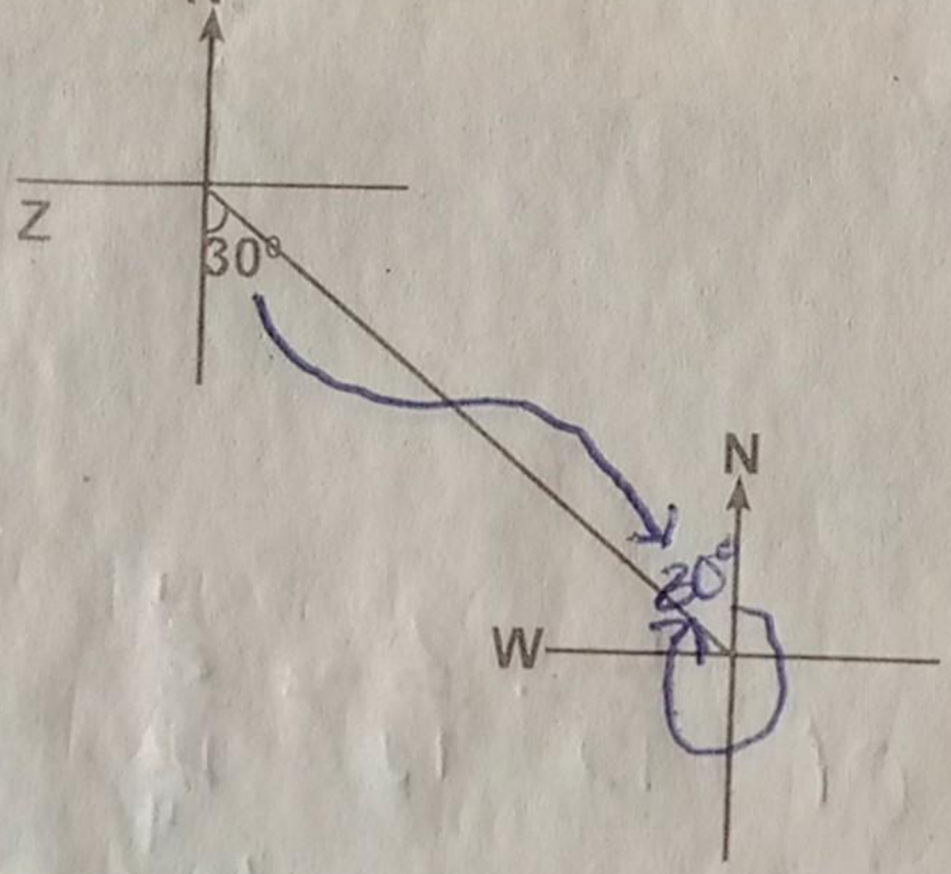
→ 110,000cm

No of revolutions

$\frac{110,000cm}{220cm}$

$\frac{500}{2_1}$ revolutions

13. Find the bearing of town **Z** from town **W** in the diagram below.



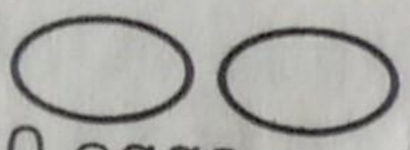
360° − 30° = 330°

14. **Increase** 180 goats in the ratio of $\frac{3}{4} : \frac{1}{2}$

$\left(\frac{3}{4} \div \frac{1}{2}\right) \times 180 goats$

$\frac{3}{4} \times \frac{2}{1} \times 180 goats$

270goats.

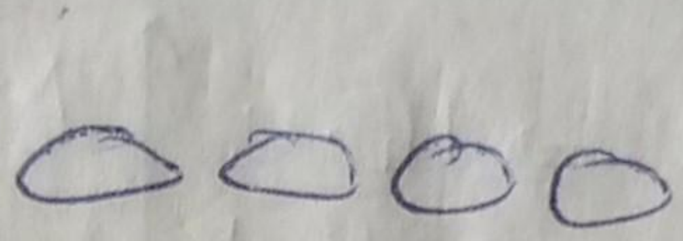
15. Given that  represent 30 eggs. Draw pictures to represent 60 eggs.

2 pics → 30 eggs

1 pic → 30/2 = 15 eggs

No of pictures

60/15 = 4 pics



16. If e = -4, n = -5 and y = 3n. **Work out** the value of (e – y) n.

(e - y) n

(-4 - 3n) n

(-4 - 3 × -5) -4

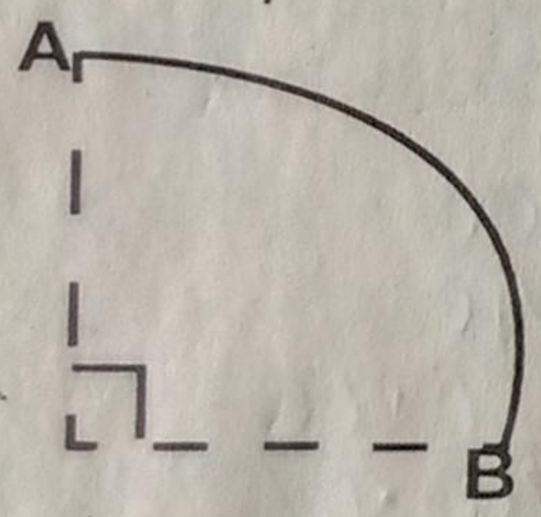
(-4 - (-15) -4

(-4 + 15) -4

11 × -4

-44

17. The length of the arc **AB** in the figure below is 66cm. Find its radius. (take π as 22/7)



1/4 × 2πr = C

1/4 × 1/2 × 22/7 r = 66cm

1/4 × 11r/7 = 66cm × 7

11r/44 = 66cm × 7/44

radius = 42cm

18. **Solve** for **b**; $2^{3b} \div 2^{b} = 64$

$2^{3b} \div 2^{b} = 2^{6}$

$2^{3b-b} = 2^{6}$

3b - b = 6

2b/2 = 6³/2

b = 3

2	64
2	32
2	16
2	8
2	4
2	2
	1

19. A motorist travelling at a speed of 120km/h took 40 minutes to travel from town **K** to town **M**. Work out the distance between the two towns.

60min → 1h.

40min → $\frac{40}{60}$ h

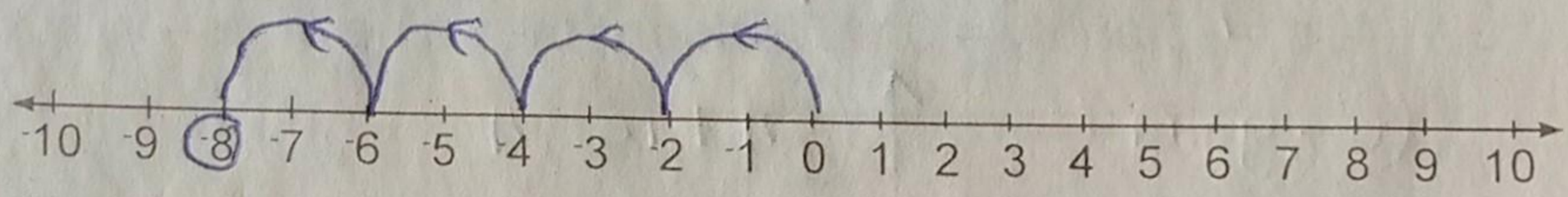
D = S x T

$D = \frac{120km}{1h} \times \frac{40}{60} h$

D = 80km

20. Use the number line below to work out 4 x -2.

4 groups of -2



4 X -2 = -8

SECTION B: 60 MARKS

Attempt **all** *questions in this section.*

Marks for **each part** *of the question are* **indicated** *in the brackets.*

21. (a) **Find** the number that has been expanded below;

$(3x10^2) + (4x10^1) + (6x10^{-2})$ (02 marks)

$3 \times 10 \times 10 + 4 \times 10 + 6 \times \frac{1}{10 \times 10}$

$300 + 40 + \frac{6}{100}$

300 + 40 + 0·06

300
40
+ 0·06
340·06

(b) Write **1095** in scientific notation. (02 marks)

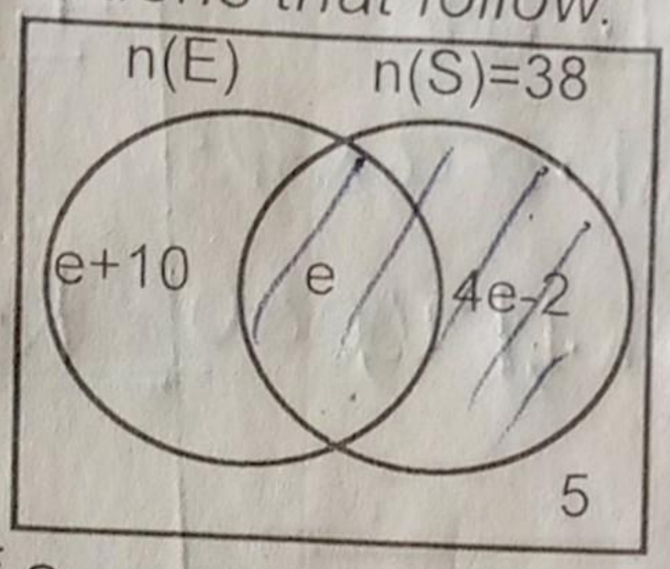
1095 ÷ 10 = 109·5

109·5 ÷ 10 = 10·95

10·95 ÷ 10 = 1·095

1095 → $1{\cdot}095 \times 10^3$

22. The Venn diagram below shows the number of pupils who like English (E) and Science (S) in primary six class. *Study it carefully and answer the questions that follow.*



(a) Find the value of e. *(02 marks)*

$e+4e-2=38$

$5e-2=38$

$5e-2+2=38+2$

$\frac{5e}{5}=\frac{40}{5}$

$e=8$

(b) How many pupils like only one subject? *(02 marks)*

$n(E)\text{ only} + n(S)\text{ only}$

$(e+10)+(4e-2)$

$(8+10)+(4\times8-2)$

$18+(32-2)$

$18+30$

48 pupils

23. **Below is the exchange rate of a certain Forex Bureau.**

1 Kenya shilling = Ug sh 30

1 US dollar = Ug sh 3600

1 British Pound Sterling = Ug sh 4700

(a) Express the Uganda shillings 1,410,000 to British Pound Sterling. *(02 marks)*

Ugsh. 4700 ⟷ 1 pound

Ugsh. 1,410,000 ⟷ $\left(\frac{1,410,000}{4700}\right)$ pounds

$\frac{1}{3}$

$\times \frac{3}{47}$

141

300 pounds

b) Jane bought a motorcycle at 325 dollars. Find the cost of the motorcycle in Kenya shillings. *(03 marks)*

1 dollar ⟷ Ugsh. 3600

325 dollars ⟷ Ugsh. 3600 × 325

→ Ugsh. 1,170,000

Cost in K.sh.

39000

1,170,000

30

1

K.sh. 39,000

325 × 36 = 1950 + 975 = 11700

24. A primary six pupil was given cards with digits **5, 3, 0** and **4** to form four digit numerals;

(a) Write the smallest and biggest numerals formed:

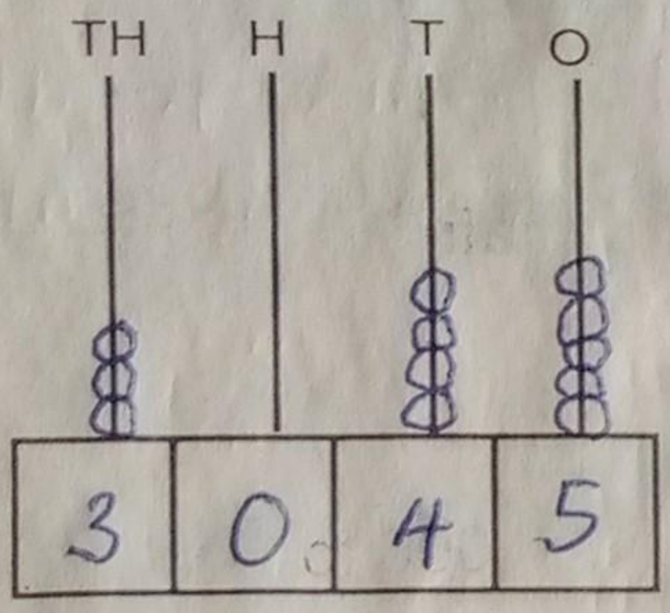
(i) smallest numeral *(01 mark)*

3045

(i) biggest numeral *(01 mark)*

5430

(b) Represent the smallest numeral on the abacus below. *(02 marks)*



Th H T O

3045

25. The exterior and interior angles of a regular polygon are in the ratio of 2: 3 respectively.

(a) Name the polygon. *(03 marks)*

Total parts: 2 + 3 = 5 parts

5 parts → 180°

1 part → 36°

2 parts → 36° × 2

Ext∠ = 72°

No. of sides

360° ÷ 5

72°

5 sides

Pentagon.

(b) How many triangles has the polygon? (02 marks)

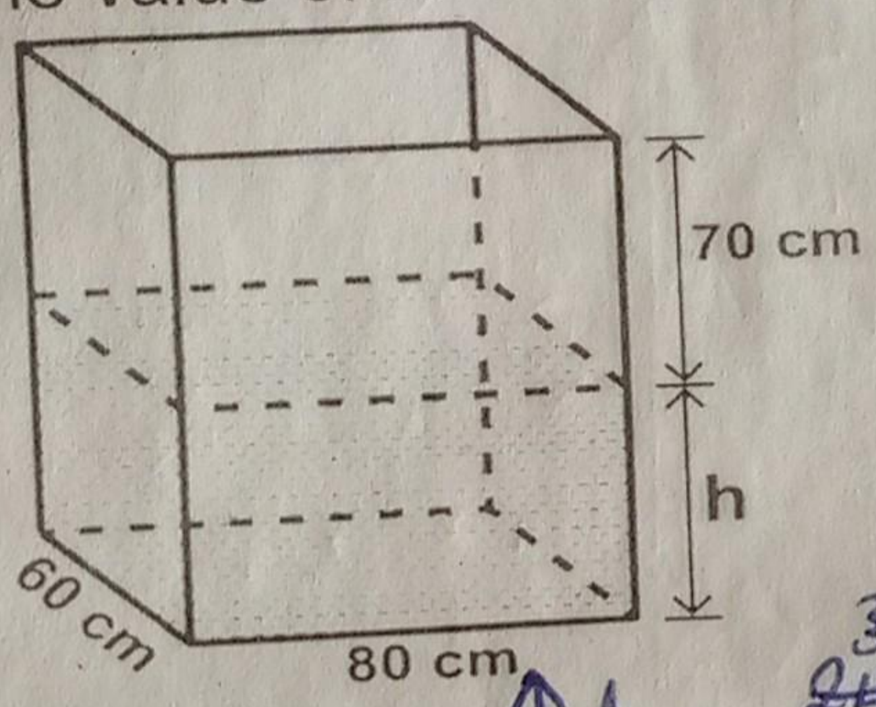
No of triangles = n - 2

5 - 2

3 triangles.

26. The tank below has 240 litres of water in it. *Study it carefully and use it to answer the questions that follow.*

(a) Find the value of h. (02 marks)



$V = C \times 1000 cm^3$

$V = 240l \times 1000 cm^3$

$V = 240,000 cm^3$

$h = \frac{V}{L \times W}$

$h = \frac{240000 cm \times cm \times cm}{80 cm \times 60 cm}$

$h = 50 cm$

(b) How many litres of water should be added to fill the tank? (03 mark

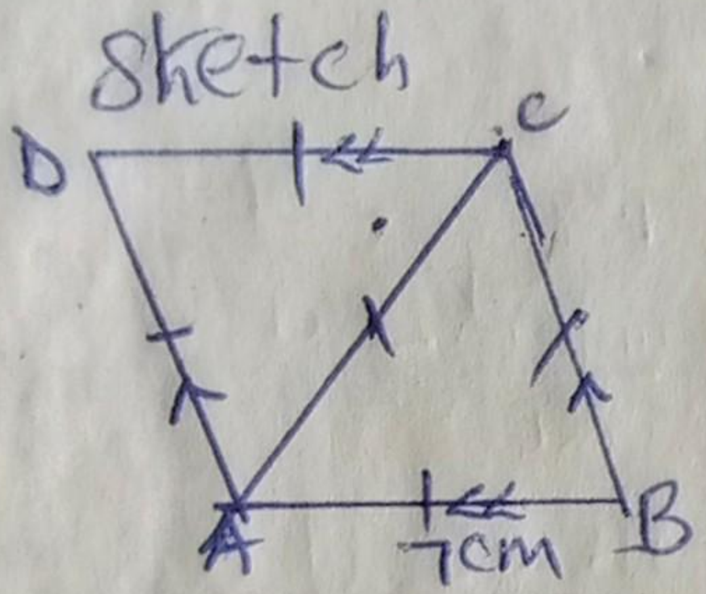
$C = \left(\frac{V}{1000 cm^3}\right)$ litres

$C = \left(\frac{80 cm \times 60 cm \times 70 cm}{1000 cm \times cm \times cm}\right)$ litres

$C = 224$ litres.

224 Litres are needed to fill the tank.

27.(a) Using a ruler, a pencil, and a pair of compasses only, construct a rhombus ABCD such that triangle ABC is an equilateral triangle of side 7cm. *(05 marks)*



(b) Measure diagonal AC. *(01 mark)*

28. Solve for **m**:

(a) 4(m-1) -2(m+3) = 0 *(03 marks)*

$4(m-1)-2(m+3)=0$

$4m-4-2m-6=0$

$4m-2m-4-6=0$

$2m-10=0$

$2m-0+10=0+10$

$\frac{2m}{2}=\frac{10}{2}$

$m=5$

(b) Kasozi is 58 years old and Magezi is 14 years old. In how many years' time will Kasozi be thrice as old as Magezi? *(03 marks)*

Let 'p' rep the years.

	Now	In 'p' yrs
Kasozi	58	58+p
Magezi	14	14+p

$3(14+p)=58+p$

$42+3p=58+p$

$42-42+3p=58-42+p$

$3p=16+p$

$3p-p=16+p-p$

$\frac{2p}{2}=\frac{16^{8}}{2}$

$p=8$ years.

29. Macula used 0.25 of her money to buy a loaf of bread, ½ of the remainder for tea leaves and sugar and saves the rest.

(a) Find the fraction spent on savings. *(03 marks)*

Bread : $\frac{25}{100} = \frac{1}{4}$

Remainder : $1 - \frac{1}{4} = \frac{4-1}{4}$

$\frac{3}{4}$

Tea leaves and Sugar

$\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

Total fraction

$\frac{1}{4} + \frac{3}{8} = \frac{2+3}{8}$

$\frac{5}{8}$

Savings

$1 - \frac{5}{8} = \frac{8-5}{8}$

$\frac{3}{8}$

(b) If she saved sh.3,600, find the amount of money she spent on a loaf of bread. *(03 marks)*

Total amount

Sh. 3,600 ÷ $\frac{3}{8}$

Sh. $\frac{1}{3,600} \times \frac{8}{3}$,

Sh. 9,600

Loaf of bread

$\frac{1}{4} \times$ Sh. $\frac{24}{9,600}$

Sh. 2,400

30. The median of 4 consecutive even numbers is 13;

(a) Find the numbers. *(03 marks)*

Let 'm' rep the 1st no

1st	2nd	3rd	4th
m ,	m+2 ,	m+4 ,	m+6

$\frac{m+2+m+4}{2} = 13$

$\frac{m+m+2+4}{2} = 13$

$\frac{1}{2} \times \frac{2m+6}{2} = 13 \times 2$

$2m + 6 = 26$

$2m + 6 - 6 = 26 - 6$

$\frac{1}{2}m = \frac{20}{2}^{10}$

$m = 10$

2nd no : 10+2 = 12

3rd no : 10+4 = 14

4th no : 10+6 = 16

10, 12, 14, 16

(b) Work out the sum of the smallest and largest numbers. *(02 marks)*

Sum : 16
+10
26

31. A cyclist travelled at a speed of 80km/h covering a certain distance from town **W** to town **Y** taking 3hours.It rested at town Y for half an hour before continuing to town **Z** a distance of 100km at a speed of 40km/h.

(a) How far is town Y from town **W**? *(02 marks)*

$D = S \times T$

$D = \frac{80km}{1h} \times 3h$

$D = 240km$

(b) Calculate the cyclist's average speed for the whole journey. *(03 marks)*

From y to z

$T = D \div S$

$T = 100km \div \frac{40km}{1h}$

$T = \frac{5}{\cancel{100km}} \times \frac{1h}{\cancel{40km}_{1}}$

$T = 2\frac{1}{2}h$

$A.S = \frac{240km + 100km}{3h + \frac{1}{2}h + 2\frac{1}{2}h}$

$A.S = \frac{340km}{6h}$

$A.S = 56\frac{2}{3}km/h.$

32. Given that $y = 2x + 3$. Complete the table below. *(05 marks)*

X	0	1	-2	-3	3
Y	3	5	-1	-3	9

$y = 2x + 3$

$y = 2 \times 0 + 3$

$y = 0 + 3$

$y = 3$

$2x + 3 = 5$

$2x + 3 - 3 = 5 - 3$

$\frac{2x}{2} = \frac{2}{2}$

$x = 1$

$y = 2x + 3$

$y = 2x - 2 + 3$

$y = -4 + 3$

$y = -1$

$2x + 3 = -3$

$2x + 3 - 3 = -3 - 3$

$\frac{2y}{2} = \frac{-6}{2}$

$y = -3$

$y = 2x + 3$

$y = 2 \times 3 + 3$

$y = 6 + 3$

$y = 9$